	Type	L #	Hits	Search Text	DBs
1	BRS	L1	97257	field near8 effect near8 transistor	US-PGPUB; USPAT
2	BRS	L2	583	1 and nanowire	US-PGPUB; USPAT
3	BRS	L3	37	2 and heater	US-PGPUB; USPAT
4	BRS	L5	3	4 and silicon with dop$9 with nanowire	US-PGPUB; USPAT
5	BRS	L4	35	3 and insulat$9	US-PGPUB; USPAT
6	BRS	L6	1144	1 and (nanowire or nanotube or nanorod)	US-PGPUB; USPAT
7	BRS	L7	82	6 and heater	US-PGPUB; USPAT
8	BRS	L8	25	7 and thermal$9 near8 insulat$9	US-PGPUB; USPAT
9	BRS	L9	24	8 and (sensor or detector)	US-PGPUB; USPAT

	Type	L #	Hits	Search Text	DBs
1	BRS	L1	13	("20020117659"|"20020130311"|"20030089899"|"20030113714"|"20030121764"|"20030139003"|"20030153088"|"20030205078"|"4020830"|"5731510"|"6265222"|"6596236"|"6627964").PN.	US-PGPUB; USPAT
2	IS&R	L2	3	(("6559468") or ("7048903") or ("6468657")).PN.	USPAT

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NEWS 1		Web Page URLs for STN Seminar Schedule - N. America
NEWS 2		"Ask CAS" for self-help around the clock
NEWS 3	DEC 18	CA/CAplus pre-1967 chemical substance index entries enhanced with preparation role
NEWS 4	DEC 18	CA/CAplus patent kind codes updated
NEWS 5	DEC 18	MARPAT to CA/CAplus accession number crossover limit increased to 50,000
NEWS 6	DEC 18	MEDLINE updated in preparation for 2007 reload
NEWS 7	DEC 27	CA/CAplus enhanced with more pre-1907 records
NEWS 8	JAN 08	CHEMLIST enhanced with New Zealand Inventory of Chemicals
NEWS 9	JAN 16	CA/CAplus Company Name Thesaurus enhanced and reloaded
NEWS 10	JAN 16	IPC version 2007.01 thesaurus available on STN
NEWS 11	JAN 16	WPIDS/WPINDEX/WPIX enhanced with IPC 8 reclassification data
NEWS 12	JAN 22	CA/CAplus updated with revised CAS roles
NEWS 13	JAN 22	CA/CAplus enhanced with patent applications from India
NEWS 14	JAN 29	PHAR reloaded with new search and display fields
NEWS 15	JAN 29	CAS Registry Number crossover limit increased to 300,000 in multiple databases
NEWS 16	FEB 15	PATDPASPC enhanced with Drug Approval numbers
NEWS 17	FEB 15	RUSSIAPAT enhanced with pre-1994 records
NEWS 18	FEB 23	KOREAPAT enhanced with IPC 8 features and functionality
NEWS 19	FEB 26	MEDLINE reloaded with enhancements
NEWS 20	FEB 26	EMBASE enhanced with Clinical Trial Number field
NEWS 21	FEB 26	TOXCENTER enhanced with reloaded MEDLINE
NEWS 22	FEB 26	IFICDB/IFIPAT/IFIUDB reloaded with enhancements
NEWS 23	FEB 26	CAS Registry Number crossover limit increased from 10,000 to 300,000 in multiple databases
NEWS 24	MAR 15	WPIDS/WPIX enhanced with new FRAGHITSTR display format
NEWS 25	MAR 16	CASREACT coverage extended
NEWS 26	MAR 20	MARPAT now updated daily
NEWS 27	MAR 22	LWPI reloaded
NEWS 28	MAR 30	RDISCLOSURE reloaded with enhancements
NEWS 29	MAR 30	INPADOCDB will replace INPADOC on STN
NEWS 30	APR 02	JICST-EPLUS removed from database clusters and STN

NEWS EXPRESS NOVEMBER 10 CURRENT WINDOWS VERSION IS V8.01c, CURRENT MACINTOSH VERSION IS V6.0c(ENG) AND V6.0Jc(JP), AND CURRENT DISCOVER FILE IS DATED 25 SEPTEMBER 2006.

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NEWS LOGIN	Welcome Banner and News Items
NEWS IPC8	For general information regarding STN implementation of IPC 8
NEWS X25	X.25 communication option no longer available

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* * * * * * * * * * * * * * * * STN Columbus * * * * * * * * * * * * * * * *

FILE 'HOME' ENTERED AT 18:26:54 ON 12 APR 2007

=> file caplus inspec compendex

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FULL ESTIMATED COST	0.21	0.21

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FILE 'COMPENDEX' ENTERED AT 18:27:08 ON 12 APR 2007

=> s field (8w) effect (8w) transistor
L1 87290 FIELD (8W) EFFECT (8W) TRANSISTOR

=> s l1 and nanowire
L2 927 L1 AND NANOWIRE

=> s l2 and integ? (8w) heat?
L3 2 L2 AND INTEG? (8W) HEAT?

=> s l2 and thermal? (8w) insulat?
L4 1 L2 AND THERMAL? (8W) INSULAT?

=> s l3 and l4
L5 1 L3 AND L4

=> display l5 1 ibib abs

L5 ANSWER 1 OF 1 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:1050367 CAPLUS
DOCUMENT NUMBER: 143:328288
TITLE: Fluid sensor and its fabrication
INVENTOR(S): Wei, Qingqiao
PATENT ASSIGNEE(S): Hewlett-Packard Development Company, L.P. Intellectual Property Administration, USA
SOURCE: U.S. Pat. Appl. Publ., 11 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

US 2005212531	A1	20050929	US 2004-807932	20040323
EP 1580547	A1	20050928	EP 2005-251552	20050315
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, BA, HR, IS, YU				
JP 2005283578	A	20051013	JP 2005-81091	20050322

PRIORITY APPLN. INFO.: US 2004-807932 A 20040323

AB A fluid sensor for use in an environment having an ambient temperature has a field-effect transistor comprising a catalyst-functionalized silicon semiconductor nanowire, an integral heater near the transistor to heat it to an elevated temperature relative to the ambient temperature, and integral thermal insulation to maintain the transistor at the elevated temperature The catalyst interacts with the fluid to be sensed and is able to affect the elec. characteristics of the transistor. Typically the catalyst is a metal such as platinum.

=> display l3 1-2 ibib abs

L3 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:1050367 CAPLUS
DOCUMENT NUMBER: 143:328288
TITLE: Fluid sensor and its fabrication
INVENTOR(S): Wei, Qingqiao
PATENT ASSIGNEE(S): Hewlett-Packard Development Company, L.P. Intellectual Property Administration, USA
SOURCE: U.S. Pat. Appl. Publ., 11 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005212531	A1	20050929	US 2004-807932	20040323
EP 1580547	A1	20050928	EP 2005-251552	20050315
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, BA, HR, IS, YU				
JP 2005283578	A	20051013	JP 2005-81091	20050322

PRIORITY APPLN. INFO.: US 2004-807932 A 20040323

AB A fluid sensor for use in an environment having an ambient temperature has a field-effect transistor comprising a catalyst-functionalized silicon semiconductor nanowire, an integral heater near the transistor to heat it to an elevated temperature relative to the ambient temperature, and integral thermal insulation to maintain the transistor at the elevated temperature The catalyst interacts with the fluid to be sensed and is able to affect the elec. characteristics of the transistor. Typically the catalyst is a metal such as platinum.

L3 ANSWER 2 OF 2 COMPENDEX COPYRIGHT 2007 EEI on STN
ACCESSION NUMBER: 2006(17):1930 COMPENDEX
TITLE: A comparison between Sno2 nanowires and nanofibers for advanced environmental sensing.
AUTHOR: Vander Wal, Randy L.; Berger, Gordon M.; Hunter, Gary W.; Xu, Jennifer C.; Evans, Laura J.; Liu, C.C.
MEETING TITLE: 05AIChE: 2005 AIChE Annual Meeting and Fall Showcase.

MEETING LOCATION: Cincinnati, OH, United States
MEETING DATE: 30 Oct 2005-04 Nov 2005
SOURCE: AIChE Annual Meeting, Conference Proceedings 2005.p 11922
SOURCE: AIChE Annual Meeting, Conference Proceedings 2005.p 11922
SOURCE: 05AIChE: 2005 AIChE Annual Meeting and Fall Showcase, Conference Proceedings
PUBLICATION YEAR: 2005
MEETING NUMBER: 66925
DOCUMENT TYPE: Conference Article
TREATMENT CODE: Theoretical
LANGUAGE: English
AN 2006(17):1930 COMPENDEX
AB Nanoscale structures offer an extremely high surface/volume ratio which will improve the sensitivity, dynamic range and decrease the response time by more than 10-fold. Presented here is a comparison of the sensing capabilities of nanowires and nanofibers. With a diameter approaching twice the nominal charge depletion layer thickness ([similar to]10's of nanometers), the conducting channel of a nanowire is nearly entirely depleted upon adsorption of oxidizing gases, therein leading to electrical conductivity mimicking that of a field effect transistor. Although somewhat thicker, the polycrystallinity and cylindrical structure of a nanofiber permits deeper penetration of the depletion layer into the structure. Essentially the same narrowing of the conduction channel occurs. With the entire bulk of the material responsive to surface adsorbed species, sensitivity gains of 10- to 100- fold relative to film materials. Moreover, carrier depletion (or replenishment) throughout the "bulk" nanostructure will expand the dynamic range by the virtue of adsorbates leading to full charge depletion (or replenishment) and infinite (or very low) resistance. These two forms of linear 1-d sensing elements require very different fabrication and integration processes for commercial sensing devices. Electrospinning offers direct deposition, composition control and potentially a very reactive surface reflecting the polycrystallinity of the material. Yet calcination will involve the entire substrate (sensor platform). CVD synthesized nanowires offer uniform crystal surfaces, resistance to sintering and their synthesis may be done apart from the substrate. Yet the higher the crystalline perfection, the fewer the chemisorption sites and hence the lower sensitivity and dynamic range. Electrospun nanofibers offer a dry fabrication process on the sensor chip apart from the sol-gel + polymer precursor solution. CVD nanowires will require liquid phase deposition as a washcoat and perhaps an additional binder such as a sol-gel solution. Each method is capable of synthesizing a full suite of materials including SnO2, ZnO, In2O3, etc. The work presented here will compare advantages and limitations of these two competing technologies for chemiresistors. Comparative measurements will be presented using each fabrication method supported by an interdigitated array and integral heater platform.

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FILE CONTAINS CURRENT INFORMATION.
LAST RELOADED: Apr 6, 2007 (20070406/UP).

=> s l2 and heat?
164 FIELD
195 FIELDS
198 FIELD
(FIELD OR FIELDS)
2 EFFECT
21 EFFECTS
21 EFFECT
(EFFECT OR EFFECTS)
0 TRANSISTOR
0 FIELD (8W) EFFECT (8W) TRANSISTOR
0 NANOWIRE
8 HEAT?
L6 0 L2 AND HEAT?

=> file caplus inspec compendex

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	0.12	30.02

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE ENTRY	TOTAL SESSION
CA SUBSCRIBER PRICE	0.00	-1.56

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=> s field (8w) effect (8w) transistor
L7 87290 FIELD (8W) EFFECT (8W) TRANSISTOR

=> s l7 and nanowire
L8 927 L7 AND NANOWIRE

=> s l8 and heater
L9 2 L8 AND HEATER

=> s l8 and insulation
L10 2 L8 AND INSULATION

=> display l9 1-2 ibib abs

L9 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:1050367 CAPLUS
DOCUMENT NUMBER: 143:328288
TITLE: Fluid sensor and its fabrication

INVENTOR(S): Wei, Qingqiao
PATENT ASSIGNEE(S): Hewlett-Packard Development Company, L.P. Intellectual Property Administration, USA
SOURCE: U.S. Pat. Appl. Publ., 11 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005212531	A1	20050929	US 2004-807932	20040323
EP 1580547	A1	20050928	EP 2005-251552	20050315
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, BA, HR, IS, YU				
JP 2005283578	A	20051013	JP 2005-81091	20050322

PRIORITY APPLN. INFO.: US 2004-807932 A 20040323

AB A fluid sensor for use in an environment having an ambient temperature has a field-effect transistor comprising a catalyst-functionalized silicon semiconductor nanowire, an integral heater near the transistor to heat it to an elevated temperature relative to the ambient temperature, and integral thermal insulation to maintain the transistor at the elevated temperature The catalyst interacts with the fluid to be sensed and is able to affect the elec. characteristics of the transistor. Typically the catalyst is a metal such as platinum.

L9 ANSWER 2 OF 2 COMPENDEX COPYRIGHT 2007 EEI on STN
ACCESSION NUMBER: 2006(17):1930 COMPENDEX
TITLE: A comparison between Sno2 nanowires and nanofibers for advanced environmental sensing.
AUTHOR: Vander Wal, Randy L.; Berger, Gordon M.; Hunter, Gary W.; Xu, Jennifer C.; Evans, Laura J.; Liu, C.C.
MEETING TITLE: 05AIChE: 2005 AIChE Annual Meeting and Fall Showcase.
MEETING LOCATION: Cincinnati, OH, United States
MEETING DATE: 30 Oct 2005-04 Nov 2005
SOURCE: AIChE Annual Meeting, Conference Proceedings 2005.p 11922
SOURCE: AIChE Annual Meeting, Conference Proceedings 2005.p 11922
SOURCE: 05AIChE: 2005 AIChE Annual Meeting and Fall Showcase, Conference Proceedings
PUBLICATION YEAR: 2005
MEETING NUMBER: 66925
DOCUMENT TYPE: Conference Article
TREATMENT CODE: Theoretical
LANGUAGE: English
AN 2006(17):1930 COMPENDEX
AB Nanoscale structures offer an extremely high surface/volume ratio which will improve the sensitivity, dynamic range and decrease the response time by more than 10-fold. Presented here is a comparison of the sensing capabilities of nanowires and nanofibers. With a diameter approaching twice the nominal charge depletion layer thickness ([similar to]10's of nanometers), the conducting channel of a nanowire is nearly entirely depleted upon adsorption of oxidizing gases, therein leading to electrical conductivity mimicking that of a field effect transistor. Although somewhat thicker, the polycrystallinity and cylindrical structure of a nanofiber permits deeper penetration of the depletion layer into the structure. Essentially the

same narrowing of the conduction channel occurs. With the entire bulk of the material responsive to surface adsorbed species, sensitivity gains of 10- to 100- fold relative to film materials. Moreover, carrier depletion (or replenishment) throughout the "bulk" nanostructure will expand the dynamic range by the virtue of adsorbates leading to full charge depletion (or replenishment) and infinite (or very low) resistance. These two forms of linear 1-d sensing elements require very different fabrication and integration processes for commercial sensing devices. Electrospinning offers direct deposition, composition control and potentially a very reactive surface reflecting the polycrystallinity of the material. Yet calcination will involve the entire substrate (sensor platform). CVD synthesized nanowires offer uniform crystal surfaces, resistance to sintering and their synthesis may be done apart from the substrate. Yet the higher the crystalline perfection, the fewer the chemisorption sites and hence the lower sensitivity and dynamic range. Electrospun nanofibers offer a dry fabrication process on the sensor chip apart from the sol-gel + polymer precursor solution. CVD nanowires will require liquid phase deposition as a washcoat and perhaps an additional binder such as a sol-gel solution. Each method is capable of synthesizing a full suite of materials including SnO2, ZnO, In2O3, etc. The work presented here will compare advantages and limitations of these two competing technologies for chemiresistors. Comparative measurements will be presented using each fabrication method supported by an interdigitated array and integral heater platform.

=> display l10 1-2 ibib abs

L10 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:1050367 CAPLUS
DOCUMENT NUMBER: 143:328288
TITLE: Fluid sensor and its fabrication
INVENTOR(S): Wei, Qingqiao
PATENT ASSIGNEE(S): Hewlett-Packard Development Company, L.P. Intellectual Property Administration, USA
SOURCE: U.S. Pat. Appl. Publ., 11 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 2005212531	A1	20050929	US 2004-807932	20040323
EP 1580547	A1	20050928	EP 2005-251552	20050315
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, BA, HR, IS, YU				
JP 2005283578	A	20051013	JP 2005-81091	20050322
PRIORITY APPLN. INFO.:			US 2004-807932	A 20040323

AB A fluid sensor for use in an environment having an ambient temperature has a field-effect transistor comprising a catalyst-functionalized silicon semiconductor nanowire, an integral heater near the transistor to heat it to an elevated temperature relative to the ambient temperature, and integral thermal insulation to maintain the transistor at the elevated temperature The catalyst interacts with the fluid to be sensed and is able to affect the elec. characteristics of the transistor. Typically the catalyst is a metal such as platinum.

L10 ANSWER 2 OF 2 COMPENDEX COPYRIGHT 2007 EEI on STN

ACCESSION NUMBER: 2005(16):980 COMPENDEX
TITLE: Controllable modification of SiC nanowires encapsulated in BN nanotubes.
AUTHOR: Li, Yubao (Natl. Inst. for Materials Science Advanced Materials Laboratory, Tsukuba, Ibaraki 305-0044, Japan); Dorozhkin, Pavel S.; Bando, Yoshio; Golberg, Dmitri
SOURCE: Advanced Materials v 17 n 5 Mar 8 2005 2005.p 545-549
SOURCE: Advanced Materials v 17 n 5 Mar 8 2005 2005.p 545-549
CODEN: ADVMEW . ISSN: 0935-9648
PUBLICATION YEAR: 2005
DOCUMENT TYPE: Journal
TREATMENT CODE: Experimental
LANGUAGE: English
AN 2005(16):980 COMPENDEX
AB A simple vapor-solid route for the synthesis of BN-SiC nanocables having open tip-ends and unmatched features was discussed. These features allow to selectively perform intratube operations and to independently modify the geometry and chemistry of the semiconducting SiC cores. Electrical-transport measurements performed on individual nanostructures indeed confirmed the perfect insulating nature of the BN nanotube sheaths. BN nanotube sheaths were confirmed to exhibit excellent electrical insulation of the encapsulated semiconducting nanowires .(Edited abstract) 20 Refs.

=> FIL STNGUIDE

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	27.75	57.77

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE ENTRY	TOTAL SESSION
CA SUBSCRIBER PRICE	-1.56	-3.12

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=> file caplus inspec compendex

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	0.12	57.89

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE ENTRY	TOTAL SESSION
CA SUBSCRIBER PRICE	0.00	-3.12

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FILE 'COMPENDEX' ENTERED AT 18:33:32 ON 12 APR 2007

```
=> s field (8w) effect (8w) transistor
L11      87290 FIELD (8W) EFFECT (8W) TRANSISTOR

=> s l11 and nanowire
L12        927 L11 AND NANOWIRE

=> s l12 and silicon (8w) nanowire
L13        239 L12 AND SILICON (8W) NANOWIRE

=> s l13 and dop? (8w) nanowire
L14         36 L13 AND DOP? (8W) NANOWIRE

=> s l14 and catalyst (s) nanowire
L15          3 L14 AND CATALYST (S) NANOWIRE

=> display l15 1-3 ibib abs

L15  ANSWER 1 OF 3  CAPLUS  COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER:        2005:1268332  CAPLUS
DOCUMENT NUMBER:         144:43835
TITLE:                   Synthesis and postgrowth doping of
                         silicon nanowires
AUTHOR(S):               Byon, K.; Tham, D.; Fischer, J. E.; Johnson, A. T.
CORPORATE SOURCE:        Department of Materials Science and Engineering,
                         University of Pennsylvania, Philadelphia, PA, 19104,
                         USA
SOURCE:                  Applied Physics Letters (2005), 87(19),
                         193104/1-193104/3
                         CODEN: APPLAB; ISSN: 0003-6951
PUBLISHER:               American Institute of Physics
DOCUMENT TYPE:           Journal
LANGUAGE:                English
AB   High-quality Si nanowires (SiNWs) were prepared via a thermal
     evaporation method without the use of catalysts.  SEM and
     transmission electron microscopy showed that SiNWs were long and straight
     crystalline Si with an oxide sheath.  Field effect
     transistors were fabricated to investigate the elec. transport
     properties.  Devices on as-grown material were p-channel with channel
     mobilities 1-10 cm2 V-1 s-1.  Postgrowth vapor doping with Bi converted
     these to n-channel behavior.
REFERENCE COUNT:         19    THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS
                               RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15   ANSWER 2 OF 3  INSPEC  (C) 2007 IET on STN
ACCESSION NUMBER:        2006:8690936  INSPEC
TITLE:                   Synthesis and postgrowth doping of
                         silicon nanowires
AUTHOR:                  Byon, K.; Tham, D.; Fischer, J.E.;  (Dept. of Mater.
                         Sci. & Eng., Univ. of Pennsylvania, Philadelphia, PA,
                         USA), Johnson, A.T.
SOURCE:                  Applied Physics Letters (7 Nov. 2005), vol.87, no.19,
                         p. 193104-1-3, 20 refs.
                         CODEN: APPLAB, ISSN: 0003-6951
                         SICI: 0003-6951(20051107)87:19L.193104:SPDS;1-S
                         Price: 0003-6951/2005/87(19)/193104-1(3)/$22.50
                         Doc.No.: S0003-6951(05)08244-6
                         Published by: AIP, USA
DOCUMENT TYPE:           Journal
```

TREATMENT CODE: Practical; Experimental
COUNTRY: United States
LANGUAGE: English
AN 2006:8690936 INSPEC
AB High-quality silicon nanowires (SiNWs) were synthesized via a thermal evaporation method without the use of catalysts. Scanning electron microscopy and transmission electron microscopy showed that SiNWs were long and straight crystalline silicon with an oxide sheath. Field effect transistors were fabricated to investigate the electrical transport properties. Devices on as-grown material were p-channel with channel mobilities 1-10 cm2 V-1 s-1. Postgrowth vapor doping with bismuth converted these to n-channel behavior

L15 ANSWER 3 OF 3 COMPENDEX COPYRIGHT 2007 EEI on STN
ACCESSION NUMBER: 2005(46):12721 COMPENDEX
TITLE: Synthesis and postgrowth doping of silicon nanowires.
AUTHOR: Byon, K.; Tham, D.; Fischer, J.E.; Johnson, A.T.
SOURCE: Applied Physics Letters v 87 n 19 Nov 7 2005 2005.p 1-3
SOURCE: Applied Physics Letters v 87 n 19 Nov 7 2005 2005.p 1-3, arn: 193104
CODEN: APPLAB ISSN: 0003-6951
PUBLICATION YEAR: 2005
DOCUMENT TYPE: Journal
TREATMENT CODE: Theoretical; Experimental
LANGUAGE: English
AN 2005(46):12721 COMPENDEX
AB High-quality silicon nanowires (SiNWs) were synthesized via a thermal evaporation method without the use of catalysts. Scanning electron microscopy and transmission electron microscopy showed that SiNWs were long and straight crystalline silicon with an oxide sheath. Field effect transistors were fabricated to investigate the electrical transport properties. Devices on as-grown material were p -channel with channel mobilities 1-10 cm2 V-1 s-1. Postgrowth vapor doping with bismuth converted these to n -channel behavior. $CPY 2005 American Institute of Physics. 19 Refs.

=> FIL STNGUIDE

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	34.30	92.19

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE ENTRY	TOTAL SESSION
CA SUBSCRIBER PRICE	-0.78	-3.90

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FILE CONTAINS CURRENT INFORMATION.
LAST RELOADED: Apr 6, 2007 (20070406/UP).

=> display l14 1-36 ibib abs
YOU HAVE REQUESTED DATA FROM FILE 'CAPLUS, INSPEC, COMPENDEX' - CONTINUE? (Y)/N:y

L14 ANSWER 1 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2007:200701 CAPLUS
DOCUMENT NUMBER: 146:264433
TITLE: Vertical integrated silicon nanowire field effect transistors and methods of fabrication
INVENTOR(S): Yang, Peidong; Goldberger, Joshua; Hochbaum, Allon; Fan, Rong; He, Rongrui
PATENT ASSIGNEE(S): The Regents of the University of California, USA
SOURCE: PCT Int. Appl., 71pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2007022359	A2	20070222	WO 2006-US32153	20060816

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

PRIORITY APPLN. INFO.: US 2005-709044P P 20050816
AB High-d. vertical integrated field effect transistor circuits and methods are described which are fabricated from Si, Ge, or a combination Si and Ge based on nanowires grown in place on the substrate. By way of example, vertical integrated transistors are formed from one or more nanowires which were insulated, had a gate deposited thereon, and to which a drain is coupled to the exposed tips of one or more of the nanowires. The nanowires are preferably grown over a surface or according to a desired pattern in response to dispersing metal nanoclusters over the desired portions of the substrate. In one preferred implementation, SiCl4 was used as a gas phase precursor during the nanowire growth process. In place nanowire growth is also taught in conjunction with structures, such as trenches, while bridging forms of nanowires are also described.

L14 ANSWER 2 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2007:27961 CAPLUS
DOCUMENT NUMBER: 146:217453
TITLE: Doping of germanium nanowires grown in presence of PH3
AUTHOR(S): Tutuc, E.; Chu, J. O.; Ott, J. A.; Guha, S.
CORPORATE SOURCE: IBMTJ Watson Research Center, Yorktown Heights, NY, 10598, USA
SOURCE: Applied Physics Letters (2006), 89(26), 263101/1-263101/3
CODEN: APPLAB; ISSN: 0003-6951
PUBLISHER: American Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The authors study the Au-catalyzed chemical vapor growth of Ge

nanowires in the presence of PH3, used as a dopant precursor. The device characteristics of the ensuing nanowire field effect transistors (FETs) indicate n-type, highly doped nanowires. Using a combination of different nanowire growth sequences and their FET characteristics, the authors determine that P incorporates predominately via the conformal growth, which accompanies the acicular, nanowire growth. As such, the Ge nanowires grown in the presence of PH3 contain a phosphorus doped shell and an undoped core. The authors determine the doping level in the shell to be .simeq.(1-4) + 1019 cm-3.

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L14 ANSWER 3 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:1307888 CAPLUS
DOCUMENT NUMBER: 146:111833
TITLE: Silicon nanowires synthesized by laser ablation. Control of diameter and stress by thermal oxidation and impurity doping
AUTHOR(S): Fukata, Naoki
CORPORATE SOURCE: Adv. Electron. Mater. Cent., National Institute for Materials Science, Tsukuba, 305-0044, Japan
SOURCE: Oyo Butsuri (2006), 75(12), 1481-1486
CODEN: OYBSA9; ISSN: 0369-8009
PUBLISHER: Oyo Butsuri Gakkai
DOCUMENT TYPE: Journal; General Review
LANGUAGE: Japanese

AB A review. Semiconductor one-dimensional silicon nanowires (SiNWs) are attractive as the building blocks of future vertical-type semiconductor devices such as surrounding gate field -effect transistors. For their realization, it is indispensable to investigate the control of synthesis, arraignment, and elec. properties. In this report, we introduce the size control of SiNWs using compressive stress and the self-limiting oxidation effect due to thermal oxidation Furthermore, we introduce impurity doping and the phonon confinement in SiNWs.

L14 ANSWER 4 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:1220839 CAPLUS
DOCUMENT NUMBER: 146:173305
TITLE: Transport Spectroscopy of a Single Dopant in a Gated Silicon Nanowire
AUTHOR(S): Sellier, H.; Lansbergen, G. P.; Caro, J.; Rogge, S.; Collaert, N.; Ferain, I.; Jurczak, M.; Biesemans, S.
CORPORATE SOURCE: Kavli Institute of Nanoscience, Delft University of Technology, Delft, 2628 CJ, Neth.
SOURCE: Physical Review Letters (2006), 97(20), 206805/1-206805/4
CODEN: PRLTAO; ISSN: 0031-9007
PUBLISHER: American Physical Society
DOCUMENT TYPE: Journal
LANGUAGE: English

AB We report on spectroscopy of a single dopant atom in silicon by resonant tunneling between source and drain of a gated nanowire etched from silicon on insulator. The electronic states of this dopant isolated in the channel appear as resonances in the low temperature conductance at energies below the conduction band edge. We observe the two possible charge states successively occupied by spin-up and spin-down electrons under magnetic field. The first resonance is consistent with the binding energy of the neutral D0 state of an arsenic donor. The second resonance shows a reduced charging energy due to the electrostatic coupling of the charged D- state with electrodes. Excited states and Zeeman splitting

under magnetic field present large energies potentially useful to build atomic scale devices.
REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L14 ANSWER 5 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:1110101 CAPLUS
DOCUMENT NUMBER: 146:72628
TITLE: Simple and controlled single electron transistor based on doping modulation in silicon nanowires
AUTHOR(S): Hofheinz, M.; Jehl, X.; Sanquer, M.; Molas, G.; Vinet, M.; Deleonibus, S.
CORPORATE SOURCE: DSM-DRFMC-SPSMS, CEA-Grenoble, Grenoble, F-38054, Fr.
SOURCE: Applied Physics Letters (2006), 89(14), 143504/1-143504/3
CODEN: APPLAB; ISSN: 0003-6951
PUBLISHER: American Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A simple and highly reproducible single electron transistor (SET) has been fabricated using gated silicon nanowires. The structure is a metal-oxide-semiconductor field-effect transistor made on silicon-on-insulator thin films. SOI. The channel of the transistor is the Coulomb island at low temperature Two silicon nitride spacers deposited on each side of the gate create a modulation of doping along the nanowire that creates tunnel barriers. Such barriers are fixed and controlled, like in metallic SETs. The period of the Coulomb oscillations is set by the gate capacitance of the transistor and therefore controlled by lithog. The source and drain capacitances have also been characterized. This design could be used to build more complex SET devices.
REFERENCE COUNT: 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L14 ANSWER 6 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:968698 CAPLUS
TITLE: A simple and controlled single electron transistor based on doping modulation in silicon nanowires
AUTHOR(S): Hofheinz, M.; Jehl, X.; Sanquer, M.; Molas, G.; Vinet, M.; Deleonibus, S.
CORPORATE SOURCE: DSM-DRFMC-SPSMS, CEA, Grenoble, Fr.
SOURCE: Los Alamos National Laboratory, Preprint Archive, Condensed Matter (2006) 1-4, arXiv:cond-mat/0609245, 11 Sep 2006
CODEN: LNCMFR
URL: http://aps.arxiv.org/PS_cache/cond-mat/pdf/0609/0609245.pdf
PUBLISHER: Los Alamos National Laboratory
DOCUMENT TYPE: Preprint
LANGUAGE: English
AB A simple and highly reproducible single electron transistor (SET) has been fabricated using gated silicon nanowires. The structure is a metal-oxide-semiconductor field-effect transistor made on silicon-on-insulator thin films. The channel of the transistor is the Coulomb island at low temperature Two silicon nitride spacers deposited on each side of the gate create a modulation of doping along the nanowire that creates tunnel barriers. Such barriers are fixed and controlled, like in metallic SETs. The period of the Coulomb oscillations is set by the gate capacitance of the transistor and therefore controlled by lithog. The source and drain

capacitances have also been characterized. This design could be used to build more complex SET devices.
REFERENCE COUNT: 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L14 ANSWER 7 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:766774 CAPLUS
DOCUMENT NUMBER: 145:367442
TITLE: Realization of a Linear Germanium Nanowire p-n Junction
AUTHOR(S): Tutuc, Emanuel; Appenzeller, Joerg; Reuter, Mark C.; Guha, Supratik
CORPORATE SOURCE: I.B.M. TJ Watson Research Center, Yorktown Heights, NY, 10598, USA
SOURCE: Nano Letters (2006), 6(9), 2070-2074
CODEN: NALEFD; ISSN: 1530-6984
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Germanium nanowires grown by chemical vapor deposition exhibit a peculiar dopant incorporation mechanism. The dopant atoms, such as boron and phosphorus, get incorporated through the wire surface, a mechanism which limits the doping modulation along the wire length, and therefore the fabrication of more elaborate structures that combine both n- and p-type doping. Using a novel device design that circumvents these constraints, we demonstrate here a linear Ge nanowire p-n junction.
REFERENCE COUNT: 14 THERE ARE 14 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L14 ANSWER 8 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:629576 CAPLUS
DOCUMENT NUMBER: 145:281773
TITLE: Electrical Characteristics and Chemical Stability of Non-Oxidized, Methyl-Terminated Silicon Nanowires
AUTHOR(S): Haick, Hossam; Hurley, Patrick T.; Hochbaum, Allon I.; Yang, Peidong; Lewis, Nathan S.
CORPORATE SOURCE: Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA, 91125, USA
SOURCE: Journal of the American Chemical Society (2006), 128(28), 8990-8991
CODEN: JACSAT; ISSN: 0002-7863
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Si nanowires (Si NWs) modified by covalent Si-CH3 functionality, with no intervening oxide, show atmospheric stability, high conductance values, low surface defect levels, and allow for the formation of air-stable Si NW Field-Effect Transistors (FETs) having on-off ratios >105 over a relatively small gate voltage swing (±2 V).
REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L14 ANSWER 9 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:396959 CAPLUS
DOCUMENT NUMBER: 145:93730
TITLE: Silicon p-FETs from ultrahigh density nanowire arrays
AUTHOR(S): Wang, Dunwei; Sheriff, Bonnie A.; Heath, James R.
CORPORATE SOURCE: Division of Chemistry and Chemical Engineering,

California Institute of Technology, Pasadena, CA, 91125, USA
SOURCE: Nano Letters (2006), 6(6), 1096-1100
CODEN: NALEFD; ISSN: 1530-6984
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Statistical nos. of field-effect transistors (FETs) were fabricated from a circuit of 17-nm-wide, 34-nm-pitch Si nanowires B-doped at a level of 1018 cm-3. Top-gated 4-μm-wide Si nanowire p-FETs yielded low off-currents (.apprx.10-12 A), high on/off ratios (105-106), good on current values (30 μA/μm), high mobilities (.apprx.100 cm2/V-s), and low subthreshold swing values (.apprx.80 mV/decade between 10-12 and 10-10 A increasing to 200 mV/decade between 10-10-10-8 A).
REFERENCE COUNT: 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L14 ANSWER 10 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2006:350822 CAPLUS
DOCUMENT NUMBER: 144:380511
TITLE: Molecular wire transistor
INVENTOR(S): Kuekes, Philip J.; Williams, R. Stanley
PATENT ASSIGNEE(S): Hewlett-Packard Development Company, L.P., USA
SOURCE: U.S., 13 pp., Division of U.S. Ser. No. 280,188, abandoned.
CODEN: USXXAM
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 7030408	B1	20060418	US 2000-699080	20001026
PRIORITY APPLN. INFO.:			US 1999-280188 B3	19990329

AB Bipolar and field effect mol. wire transistors are provided. The mol. wire transistor comprises a pair of crossed wires, with at least one of the wires comprising a doped semiconductor material. The pair of crossed wires forms a junction where one wire crosses another, one wire being provided with Lewis acid functional groups and the other wire being provided with Lewis base functional groups. If both wires are doped semiconductor, such as Si, one is P-doped and the other is N-doped. One wire of a given doping comprises the emitter and collector portions and the other wire comprises the base portion, which is formed by modulation doping on the wire containing the emitter and collector at the junction where the wires cross and between the emitter and collector portions, thereby forming a bipolar transistor. Both NPN and PNP bipolar transistors may be formed. Analogously, one wire may comprise doped semiconductor, such as Si, and the other wire a metal, the doped Si wire forming the source and drain and the metal wire forming the gate by modulation doping on the doped Si wire where the wires cross, between the source and drain, to form a field effect transistor. Both P-channel and N-channel FETs may be formed. The construction of both bipolar transistors and FETs on a nanometer scale, which are self-aligned and modulation-doped, is thereby enabled.
REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L14 ANSWER 11 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:1319060 CAPLUS
DOCUMENT NUMBER: 144:139934

TITLE: Realization of a silicon nanowire vertical surround-gate field-effect transistor
AUTHOR(S): Schmidt, Volker; Riel, Heike; Senz, Stephan; Karg, Siegfried; Riess, Walter; Gosele, Ulrich
CORPORATE SOURCE: IBM Zurich Research Laboratory, Rueschlikon, 8803, Switz.
SOURCE: Small (2006), 2(1), 85-88
CODEN: SMALBC; ISSN: 1613-6810
PUBLISHER: Wiley-VCH Verlag GmbH & Co. KGaA
DOCUMENT TYPE: Journal
LANGUAGE: English
AB A generic process is presented to fabricate a vertical surround gate field effect transistor (VS-FET) based on epitaxially grown nanowires. The construction principle of a conventional p-MOSFET is compared with that of the VS-FET. The process stages for the fabrication of the VS-FETs are depicted and described. No chemical or mech. polishing steps are necessary, which are difficult to control at the nm scale. In the VS-FET device, n-doped Si nanowires epitaxially grown on a p-doped substrate were used as the active material. The microstructure of the FETs was investigated by TEM, and the elec. performance was studied by current-voltage characteristics. When the gate voltage was decreased from +2 - -4 V, the current increased by 2 orders of magnitude.
REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L14 ANSWER 12 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:1312988 CAPLUS
DOCUMENT NUMBER: 145:53650
TITLE: Electrical properties of silicon nanowires
AUTHOR(S): Pei, Li-zhai; Tang, Yuan-hong; Zhang, Yong; Guo, Chi; Chen, Yang-wen
CORPORATE SOURCE: College of Materials Science and Engineering, Hunan University, Changsha, 410082, Peop. Rep. China
SOURCE: Dianzi Qijian (2005), 28(4), 949-953
CODEN: DIQIFU; ISSN: 1005-9490
PUBLISHER: Dianzi Qijian Bianjibu
DOCUMENT TYPE: Journal; General Review
LANGUAGE: Chinese
AB A review. The recent studies on elec. properties of Si nanowires are introduced. Carrier concentration and mobility, field emission and electron transport properties of intrinsic and doped Si nanowires are analyzed. The research results show that carrier concentration and mobility, field emission and electron transport properties can be improved by doping Si nanowires. Elec. properties of Si nanowires strengthen with the decrease of diameter of Si nanowires. So Si nanowires exhibit excellent application promising in nanoscale electron devices such as field effect transistor and memory cell.

L14 ANSWER 13 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:1268332 CAPLUS
DOCUMENT NUMBER: 144:43835
TITLE: Synthesis and postgrowth doping of silicon nanowires
AUTHOR(S): Byon, K.; Tham, D.; Fischer, J. E.; Johnson, A. T.
CORPORATE SOURCE: Department of Materials Science and Engineering, University of Pennsylvania, Philadelphia, PA, 19104,

USA
SOURCE: Applied Physics Letters (2005), 87(19), 193104/1-193104/3
CODEN: APPLAB; ISSN: 0003-6951
PUBLISHER: American Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English
AB High-quality Si nanowires (SiNWs) were prepared via a thermal evaporation method without the use of catalysts. SEM and transmission electron microscopy showed that SiNWs were long and straight crystalline Si with an oxide sheath. Field effect transistors were fabricated to investigate the elec. transport properties. Devices on as-grown material were p-channel with channel mobilities 1-10 cm2 V-1 s-1. Postgrowth vapor doping with Bi converted these to n-channel behavior.
REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L14 ANSWER 14 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:524697 CAPLUS
DOCUMENT NUMBER: 143:203910
TITLE: Silicon nanowires: Doping dependent n- and p-channel FET behavior
AUTHOR(S): Byon, Kumhyo; Fischer, John E.
CORPORATE SOURCE: Department of Materials Science and Engineering, University of Pennsylvania, Philadelphia, PA, 19104, USA
SOURCE: Materials Research Society Symposium Proceedings (2005), 832(Group-IV Semiconductor Nanostructures), 281-286
CODEN: MRSPDH; ISSN: 0272-9172
PUBLISHER: Materials Research Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB The elec. transport properties of field effect transistor (FET) devices made of silicon nanowires (SiNWs) synthesized by pulsed laser vaporization (PLV) were studied. From as-grown PLV-SiNW FET, we found p-channel FET behavior with low conductance. To improve conductance, spin on glass (SOG) and vapor doping were used to dope phosphorus and indium into SiNW, resp. From doping after synthesis, we could successfully make both n- and p-channel FET devices.
REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L14 ANSWER 15 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2005:123856 CAPLUS
DOCUMENT NUMBER: 142:326840
TITLE: Co-doped TiO2 nanowire electric field-effect transistors fabricated by suspended molecular template method
AUTHOR(S): Lee, Yun-Hi; Yoo, Je-Min; Park, Dong-hyuk; Kim, D. H.; Ju, B. K.
CORPORATE SOURCE: Department of Physics, Korea University, Seoul, 136-701, S. Korea
SOURCE: Applied Physics Letters (2005), 86(3), 033110/1-033110/3
CODEN: APPLAB; ISSN: 0003-6951
PUBLISHER: American Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English
AB We report on the fabrication of Co 3.4 atomic % doped TiO2 nanowire-based field-effect

transistors with a back gate of heavily doped Si substrate and their elec. field-effect functions. The TiO2:Co nanowire, which was fabricated utilizing a conventional magnetron sputtering technique on a suspended mol. template between electrodes, is a polycryst. and consists of a chain of nanoparticles on a mol. template. The N-type field -effect transistors prepared from the suspended Co-TiO2 nanowire junction were exhibited on currents, transconductances, and a mobility of up to 0.1 mA/μm, 0.2 μA/V, and μe ≈ 66 cm2/V s, resp., at room temperature

REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L14 ANSWER 16 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:944615 CAPLUS
DOCUMENT NUMBER: 141:404099
TITLE: Fabrication of conducting Si nanowire arrays
AUTHOR(S): Beckman, R. A.; Johnston-Halperin, E.; Melosh, N. A.; Luo, Y.; Green, J. E.; Heath, J. R.
CORPORATE SOURCE: Division of Chemistry and Chemical Engineering, California Institute of Technology, Pasadena, CA, 91125, USA
SOURCE: Journal of Applied Physics (2004), 96(10), 5921-5923
CODEN: JAPIAU; ISSN: 0021-8979
PUBLISHER: American Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English

AB The recent development of the superlattice nanowire pattern transfer technique allows for the fabrication of arrays of nanowires at a diameter, pitch, aspect ratio, and regularity beyond competing approaches. Here, the authors report the fabrication of conducting Si nanowire arrays with wire widths and pitches of 10-20 and 40-50 nm, resp., and resistivity values comparable to the bulk through the selection of appropriate Si-on-insulator substrates, careful reactive-ion etching, and spin-on glass doping. These results promise the realization of interesting nanoelectronic circuits and devices, including chemical and biol. sensors, nanoscale mosaics for electronics, and ultra-dense field-effect transistor arrays.

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L14 ANSWER 17 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:422966 CAPLUS
DOCUMENT NUMBER: 142:104002
TITLE: Tuning electronic properties of In2O3 nanowires by doping control
AUTHOR(S): Lei, B.; Li, C.; Zhang, D.; Tang, T.; Zhou, C.
CORPORATE SOURCE: Department of EE -Electrophysics, University of Southern California, Los Angeles, CA, 90089, USA
SOURCE: Applied Physics A: Materials Science & Processing (2004), 79(3), 439-442
CODEN: APAMFC; ISSN: 0947-8396
PUBLISHER: Springer-Verlag
DOCUMENT TYPE: Journal
LANGUAGE: English

AB We present two effective routes to tune the electronic properties of single-crystalline In2O3 nanowires by controlling the doping. The first method involves using different O2 concns. during the synthesis. Lightly (heavily) doped nanowires were produced by using high (low) O2 concns., resp., as revealed by the conductances and threshold voltages of nanowire-based field-effect transistors. Our second method exploits post-synthesis baking, as baking heavily doped nanowires

in ambient air led to suppressed conduction and a pos. shift of the threshold voltage, whereas baking lightly doped nanowires in vacuum displayed the opposite behavior. Our approaches offer viable ways to tune the electronic properties of many nonstoichiometric metal oxide systems such as In2O3, SnO2, and ZnO nanowires for various applications.

REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L14 ANSWER 18 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:258396 CAPLUS
DOCUMENT NUMBER: 141:252027
TITLE: Fabrication of conducting Si nanowire arrays
AUTHOR(S): Johnston-Halperin, E.; Beckman, R. A.; Melosh, N. A.; Luo, Y.; Green, J. E.; Heath, J. R.
CORPORATE SOURCE: Div. Chem. Chem. Eng., California Inst. Technol., Pasadena, CA, 91125, USA
SOURCE: Los Alamos National Laboratory, Preprint Archive, Condensed Matter (2004) 1-13, arXiv:cond-mat/0403518, 19 Mar 2004
CODEN: LNCMFR
URL: http://xxx.lanl.gov/pdf/cond-mat/0403518
PUBLISHER: Los Alamos National Laboratory
DOCUMENT TYPE: Preprint
LANGUAGE: English

AB The recent development of the superlattice nanowire pattern transfer (SNAP) technique allows for the fabrication of arrays of nanowires at a diameter, pitch, aspect ratio, and regularity beyond competing approaches. Here, the authors report the fabrication of conducting Si nanowire arrays with wire widths and pitches of 10-20 nm and 40-50 nm, resp., and resistivity values comparable to the bulk through the selection of appropriate Si-on-insulator substrates, careful reactive-ion etching, and spin-on glass doping. These results promise the realization of interesting nano-electronic circuits and devices, including chemical and biol. sensors, nano-scale mosaics for mol. electronics, and ultra-dense field-effect transistor (FET) arrays.

REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L14 ANSWER 19 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2004:225439 CAPLUS
TITLE: Lithography-free addressing at the nanoscale using modulation-doped silicon nanowires
AUTHOR(S): Yang, Chen; Zhong, Zhaohui; Fang, Ying; Lieber, Charles M.
CORPORATE SOURCE: Department of Chemistry and Chemical Biology, Harvard University, Cambridge, MA, 02138, USA
SOURCE: Abstracts of Papers, 227th ACS National Meeting, Anaheim, CA, United States, March 28-April 1, 2004 (2004), INOR-102. American Chemical Society: Washington, D. C.
CODEN: 69FGKM
DOCUMENT TYPE: Conference; Meeting Abstract
LANGUAGE: English

AB The development of strategies for addressing arrays of nanoscale devices is central to implementing integrated nanosystems ranging from biol. sensor arrays to nanocomputers. Here we describe a general lithog.-free approach for addressing based on axially modulation doped silicon nanowire field-effect transistor arrays. The addressable codes, which enable inputs to

turn on and off specific FET array elements, are introduced by modulation doping during synthesis of the silicon nanowires . Scanning gate microscopy investigations show that modulation-doped nanowires can be differentially gated, where regions with low dopant concentration are turned on/off relative to heavily doped regions. Studies investigating the synthetic control in these modulation doped nanowires, including the number, size and period of the differentially doped regions, will be described. In addition, fabrication of basic address decoder devices and circuits will be presented, and the prospects for highly integrated nanoarrays will be discussed.

L14 ANSWER 20 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2003:393380 CAPLUS
DOCUMENT NUMBER: 139:109441
TITLE: Programmable conductivity of silicon nanowires with side gates by surface charging
AUTHOR(S): Matsukawa, Takashi; Kanemaru, Seigo; Masahara, Meishoku; Nagao, Masayoshi; Tanoue, Hisao; Itoh, Junji
CORPORATE SOURCE: Nanoelectronics Research Institute, AIST, Ibaraki, 305-8568, Japan
SOURCE: Japanese Journal of Applied Physics, Part 1: Regular Papers, Short Notes & Review Papers (2003), 42(4B), 2422-2425
CODEN: JAPNDE
PUBLISHER: Japan Society of Applied Physics
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Silicon nanowires with programmable conductivity which utilized sensitivity of conductance to surface charging have been investigated in terms of complementary operation of p- and n-type devices. The device fabricated from a silicon-on-insulator (SOI) wafer consists of a nanowire (width ≈ 30 nm) and side gates for control of surface charging onto the nanowire. The wire current clearly exhibited hysteresis by sweeping the side gate voltage at a constant rate. The transistor characteristics obtained using the SOI substrate as a back gate also exhibited programmable threshold voltage by applying a pulse bias to the side gate. Surface potential imaging of the nanowire by means of scanning Maxwell-stress microscopy (SMM) has been carried out for correlating the programmability to surface charging. The SMM images clearly explained the origin of the programmability and the complementary operation of the p- and n-type nanowires.
REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L14 ANSWER 21 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:844594 CAPLUS
DOCUMENT NUMBER: 138:145685
TITLE: Epitaxial core-shell and core-multishell nanowire heterostructures
AUTHOR(S): Lauhon, Lincoln J.; Gudiksen, Mark S.; Wang, Deli; Lieber, Charles M.
CORPORATE SOURCE: Department of Chemistry and Chemical Biology, Harvard University, Cambridge, MA, 02138, USA
SOURCE: Nature (London, United Kingdom) (2002), 420(6911), 57-61
CODEN: NATUAS; ISSN: 0028-0836
PUBLISHER: Nature Publishing Group
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Semiconductor heterostructures with modulated composition and/or doping enable

passivation of interfaces and the generation of devices with diverse functions. In this regard, the control of interfaces in nanoscale building blocks with high surface area will be increasingly important in the assembly of electronic and photonic devices. Core-shell heterostructures formed by the growth of crystalline overlayers on nanocrystals offer enhanced emission efficiency, important for various applications. Axial heterostructures also were formed by a 1-dimensional modulation of nanowire composition and doping. However, modulation of the radial composition and doping in nanowire structures has received much less attention than planar and nanocrystal systems. Here the authors synthesize Si and Ge core-shell and multishell nanowire heterostructures using a CVD method applicable to a variety of nanoscale materials. The authors' studies of the growth of B-doped Si shells on intrinsic Si and Si-Si oxide core-shell nanowires indicate that homoepitaxy can be achieved at relatively low temps. on clean Si. The authors also demonstrate the possibility of heteroepitaxial growth of crystalline Ge-Si and Si-Ge core-shell structures, in which band-offsets drive hole injection into either Ge core or shell regions. The authors' synthesis of core-multishell structures, including a high-performance coaxially gated field-effect transistor, indicates the general potential of radial heterostructure growth for the development of nanowire-based devices.

REFERENCE COUNT: 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L14 ANSWER 22 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2002:604630 CAPLUS
DOCUMENT NUMBER: 137:360914
TITLE: Fabrication of single-electron tunneling transistors with an electrically formed Coulomb island in a silicon-on-insulator nanowire
AUTHOR(S): Kim, Dae Hwan; Sung, Suk-Kang; Kim, Kyung Rok; Lee, Jong Duk; Park, Byung-Gook
CORPORATE SOURCE: School Engineering, Inter-University Semiconductor Res. Center, Kwanak, S. Korea
SOURCE: Journal of Vacuum Science & Technology, B: Microelectronics and Nanometer Structures (2002), 20(4), 1410-1418
CODEN: JVTBD9; ISSN: 0734-211X
PUBLISHER: American Institute of Physics
DOCUMENT TYPE: Journal
LANGUAGE: English

AB For the purpose of controllable characteristics, Si single-electron tunneling transistors with an elec. formed Coulomb island are proposed and fabricated from the sidewall process technique. The fabricated devices are based on a Si-on-insulator (SOI) metal-oxide-semiconductor (MOS) field effect transistor with the depletion gate. The key fabrication technique consists of two sidewall process techniques. One is the patterning of a uniform SOI nanowire, and the other is the formation of n-doped polysilicon sidewall depletion gates. While the width of a Coulomb island is determined by the width of a SOI nanowire, its length is defined by the separation between two sidewall depletion gates which are formed by a conventional lithog. process combined with the 2nd sidewall process. These sidewall techniques combine the conventional lithog. and process technol., and guarantee the compatibility with complementary MOS process technol. Also, critical dimension depends not on the lithog. limit but on the controllability of CVD and reactive-ion etching. Very uniform weakly p-doped SOI nanowire defined by the sidewall technique effectively suppresses unintentional tunnel junctions formed by the fluctuation of the geometry or dopant in SOI nanowire, and the Coulomb island size dependence of the device characteristics confirms the good

controllability. A voltage gain larger than one and the controllability of Coulomb oscillation peak position are also successfully demonstrated, which are essential conditions for the integration of a single-electron tunneling transistor circuit. Further miniaturization and optimization of the proposed device will make room temperature designable single-electron tunneling transistors possible in the foreseeable future.

REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L14 ANSWER 23 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN

ACCESSION NUMBER: 2002:466304 CAPLUS
DOCUMENT NUMBER: 137:40958
TITLE: Nanosensors
INVENTOR(S): Lieber, Charles M.; Park, Hongkun; Wei, Quinqiao; Cui, Yi; Liang, Wenjie
PATENT ASSIGNEE(S): President and Fellows of Harvard College, USA
SOURCE: PCT Int. Appl., 65 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 3
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002048701	A2	20020620	WO 2001-US48230	20011211
WO 2002048701	A3	20030424		
WO 2002048701	A9	20030918		
WO 2002048701	A8	20031106		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CA 2430888	A1	20020620	CA 2001-2430888	20011211
AU 200229046	A	20020624	AU 2002-29046	20011211
US 2002117659	A1	20020829	US 2001-20004	20011211
US 7129554	B2	20061031		
EP 1342075	A2	20030910	EP 2001-990181	20011211
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
JP 2004515782	T	20040527	JP 2002-549958	20011211
EP 1736760	A2	20061227	EP 2006-121157	20011211
R: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LI, LU, MC, NL, PT, SE, TR, AL, BA, HR, MK, YU				
JP 2004535066	T	20041118	JP 2003-511316	20020520
US 2006054936	A1	20060316	US 2004-12549	20041215
US 2005164432	A1	20050728	US 2005-82372	20050317
US 2006175601	A1	20060810	US 2005-172408	20050630
US 2007026645	A1	20070201	US 2006-543326	20061004
US 2007032051	A1	20070208	US 2006-543336	20061004
US 2007032023	A1	20070208	US 2006-543352	20061004
US 2007032052	A1	20070208	US 2006-543746	20061004
US 2007048492	A1	20070301	US 2006-543337	20061004
PRIORITY APPLN. INFO.:			US 2000-254745P	P 20001211
			US 2001-292035P	P 20010518
			US 2000-226835P	P 20000822

US 2001-291896P	P	20010518
US 2001-292045P	P	20010518
US 2001-292121P	P	20010518
US 2001-935776	A	20010822
US 2001-348313P	P	20011109
EP 2001-990181	A3	20011211
US 2001-20004	A	20011211
WO 2001-US48230	W	20011211
US 2002-354642P	P	20020206
US 2002-152490	B2	20020520
WO 2002-US16133	W	20020520
US 2002-196337	A1	20020716
US 2003-720020	B1	20031121
US 2005-58443	B1	20050214
US 2005-82372	A1	20050317

AB Elec. devices comprised of nanowires are described, along with methods of their manufacture and use. The nanowires can be nanotubes and nanowires. The surface of the nanowires may be selectively functionalized. Nanodetector devices are described.

L14 ANSWER 24 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2002:457296 CAPLUS
DOCUMENT NUMBER: 137:378044
TITLE: Electronic transport properties of single-crystal silicon nanowires fabricated using an atomic force microscope
AUTHOR(S): Clement, N.; Tonneau, D.; Dallaporta, H.; Bouchiat, V.; Fraboulet, D.; Mariole, D.; Gautier, J.; Safarov, V.
CORPORATE SOURCE: GPEC, Department de Physique, Faculte des Sciences de Luminy, Marseille, F-13288, Fr.
SOURCE: Physica E: Low-Dimensional Systems & Nanostructures (Amsterdam, Netherlands) (2002), 13(2-4), 999-1002
CODEN: PELNFM; ISSN: 1386-9477
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English

AB We present elec. characterization of Si nanowires made from ultrathin Si-on-insulator (SOI) using a lithog. process based on an AFM. SOI wafers were 1st thinned, prepatterned and doped using conventional microelectronics processes to elaborate contact leads and pads. Between contacts, the upper Si was further thinned down to 15 nm and n-doped by As implantation. The Si top layer is then locally patterned using local oxidation induced under the biased tip of the AFM. The active part of the device is finally obtained by Si selective wet etching using the AFM-made oxide pattern as a mask. This technique was used to study elec. transport through Si wires with sub-1000 nm2 cross-section. The implementation of both side gates and backgate control allowed to test a full device which acts at room temperature as a field effect transistor. Current densities as high as 2 + 105 A/cm2 can be switched off by lateral gate control. At low temps., aperiodic oscillations of the nanowire current are observed while the gate voltage is swept. This behavior is attributed to potential variations along the wire caused by random fluctuations of dopants.

REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L14 ANSWER 25 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2001:614845 CAPLUS
DOCUMENT NUMBER: 135:285162
TITLE: Nanowire nanosensors for highly sensitive and selective detection of biological and chemical

species
AUTHOR(S): Cui, Yi; Wei, Qingqiao; Park, Hongkun; Lieber, Charles M.
CORPORATE SOURCE: Department of Chemistry and Chemical Biology, Harvard University, Cambridge, MA, 02138, USA
SOURCE: Science (Washington, DC, United States) (2001), 293(5533), 1289-1292
CODEN: SCIEAS; ISSN: 0036-8075
PUBLISHER: American Association for the Advancement of Science
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Boron-doped silicon nanowires (SiNWs) were used to create highly sensitive, real-time elec. based sensors for biol. and chemical species. Amine- and oxide-functionalized SiNWs exhibit pH-dependent conductance that was linear over a large dynamic range and could be understood in terms of the change in surface charge during protonation and deprotonation. Biotin-modified SiNWs were used to detect streptavidin down to at least a picomolar concentration range. In addition, antigen-functionalized SiNWs show reversible antibody binding and concentration-dependent detection in real time. Lastly, detection of the reversible binding of the metabolic indicator Ca2+ was demonstrated. The small size and capability of these semiconductor nanowires for sensitive, label-free, real-time detection of a wide range of chemical and biol. species could be exploited diagnostics.
REFERENCE COUNT: 22 THERE ARE 22 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L14 ANSWER 26 OF 36 CAPLUS COPYRIGHT 2007 ACS on STN
ACCESSION NUMBER: 2000:304664 CAPLUS
DOCUMENT NUMBER: 133:11328
TITLE: Doping and Electrical Transport in Silicon Nanowires
AUTHOR(S): Cui, Yi; Duan, Xiangfeng; Hu, Jiangtao; Lieber, Charles M.
CORPORATE SOURCE: Department of Chemistry and Chemical Biology, Harvard University, Cambridge, MA, 02138, USA
SOURCE: Journal of Physical Chemistry B (2000), 104(22), 5213-5216
CODEN: JPCBFK; ISSN: 1089-5647
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Single-crystal n-type and p-type silicon nanowires (SiNWs) have been prepared and characterized by elec. transport measurements. Laser catalytic growth was used to introduce controllably either boron or phosphorus dopants during the vapor phase growth of SiNWs. Two-terminal, gate-dependent measurements made on individual boron-doped and phosphorus-doped SiNWs show that these materials behave as p-type and n-type materials, resp. Ests. of the carrier mobility made from gate-dependent transport measurements are consistent with diffusive transport. In addition, these studies show it is possible to heavily dope SiNWs and approach a metallic regime. Temperature-dependent measurements made on heavily doped SiNWs show no evidence for Coulomb blockade at temps. down to 4.2 K, and thus testify to the structural and electronic uniformity of the SiNWs. Potential applications of the doped SiNWs are discussed.
REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L14 ANSWER 27 OF 36 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2007:9297868 INSPEC
TITLE: Inversion-mode operation of thermally-oxidized

modulation-doped silicon
nanowire field effect devices

AUTHOR: Yanfeng Wang; Tsung-Ta Ho; (Dept. of Electr. Eng., Pennsylvania State Univ., University Park, PA, USA), Dilts, S.; Kok-Keong Lew; Bangzhi Liu; Mohney, S.; Redwing, J.; Mayer, T.

SOURCE: Device Research Conference (IEEE Cat. No. 06TH8896), 2006, p. 175-6 of xvi+296 pp., 6 refs.
ISBN: 0 7803 9748 7
Price: 0 7803 9748 7/2006/$20.00
Published by: IEEE, Piscataway, NJ, USA
Conference: Device Research Conference, University Park, PA, USA, 26-28 June 2006
Sponsor(s): IEEE Electron Devices Soc

DOCUMENT TYPE: Conference; Conference Article
TREATMENT CODE: Practical; Experimental
COUNTRY: United States
LANGUAGE: English

AN 2007:9297868 INSPEC

AB There has been considerable interest in bottom-up integration of semiconductor nanowires for their application in future logic, memory, and sensor circuits. Uniformly-doped p- and n-type silicon nanowires (SiNWs) of varying carrier density have been synthesized and used to fabricate SiNW field effect transistors (FETs). Moreover dry oxidation of as-grown SiNWs has been shown to suppress the large hysteresis observed in the subthreshold characteristics of unpassivated back-gated SiNW FETs and facilitate fabrication of top-gated SiNW FETs using the SiO2 shell as the gate dielectric. However, these SiNW FETs operate by modulation of the Schottky-barrier at the source/drain (S/D) contacts or by depletion of the doped channel, which gives rise to low on-state currents and on-off ratio. In this talk, the authors will present the results of top-gated FETs fabricated using thermally-oxidized SiNWs with axially-modulated n+-p--n+ doping that operate by inversion of the p--channel and show a dramatic improvement in device properties as compared to uniformly-doped SiNW FETs

L14 ANSWER 28 OF 36 INSPEC (C) 2007 IET on STN

ACCESSION NUMBER: 2006:9133795 INSPEC

TITLE: Simple and controlled single electron transistor based on doping modulation in silicon nanowires

AUTHOR: Hofheinz, M.; Jehl, X.; Sanquer, M.; (CEA, Grenoble, France), Molas, G.; Vinet, M.; Deleonibus, S.

SOURCE: Applied Physics Letters (2 Oct. 2006), vol.89, no.14, p. 143504-1-3, 25 refs.
CODEN: APPLAB, ISSN: 0003-6951
SICI: 0003-6951(20061002)89:14L.143504:SCSE;1-4
Price: 0003-6951/2006/89(14)/143504-1(3)/$23.00
Doc.No.: S0003-6951(06)26240-5
Published by: AIP, USA

DOCUMENT TYPE: Journal
TREATMENT CODE: Practical; Experimental
COUNTRY: United States
LANGUAGE: English

AN 2006:9133795 INSPEC

AB A simple and highly reproducible single electron transistor (SET) has been fabricated using gated silicon nanowires. The structure is a metal-oxide-semiconductor field-effect transistor made on silicon-on-insulator thin films. The channel of the transistor is the Coulomb island at low temperature. Two silicon nitride spacers deposited on each side of the gate create a modulation of

doping along the nanowire that creates tunnel barriers. Such barriers are fixed and controlled, like in metallic SETs. The period of the Coulomb oscillations is set by the gate capacitance of the transistor and therefore controlled by lithography. The source and drain capacitances have also been characterized. This design could be used to build more complex SET devices

L14 ANSWER 29 OF 36 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2006:8722742 INSPEC
TITLE: Electrical properties of silicon nanowires
AUTHOR: Pei Li-zhai; Tang Yuan-hong; Zhang Yong; Guo Chi; Chen Yang-wen (Coll. of Mater. Sci. & Eng., Hunan Univ., Changsha, China)
SOURCE: Chinese Journal of Electron Devices (Dec. 2005), vol.28, no.4, p. 949-53, 34 refs.ISSN: 1005-9490
SICI: 1005-9490(200512)28:4L.949:EPSN;1-B
Published by: Editorial Dept. of the Chinese J. Electron Devices, China
DOCUMENT TYPE: Journal
TREATMENT CODE: Experimental
COUNTRY: China
LANGUAGE: Chinese
AN 2006:8722742 INSPEC
AB The recent studies on electrical properties of silicon nanowires are introduced. Carrier concentration and mobility, field emission and electron transport properties of intrinsic and doped silicon nanowires are analyzed. The research results show that carrier concentration and mobility, field emission and electron transport properties can be improved by doping silicon nanowires. Electrical properties of silicon nanowires strengthen with the decrease of diameter of silicon nanowires. So silicon nanowires exhibit excellent application promising in nanoscale electron devices such as field effect transistor and memory cell

L14 ANSWER 30 OF 36 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2006:8690936 INSPEC
TITLE: Synthesis and postgrowth doping of silicon nanowires
AUTHOR: Byon, K.; Tham, D.; Fischer, J.E.; (Dept. of Mater. Sci. & Eng., Univ. of Pennsylvania, Philadelphia, PA, USA), Johnson, A.T.
SOURCE: Applied Physics Letters (7 Nov. 2005), vol.87, no.19, p. 193104-1-3, 20 refs.
CODEN: APPLAB, ISSN: 0003-6951
SICI: 0003-6951(20051107)87:19L.193104:SPDS;1-S
Price: 0003-6951/2005/87(19)/193104-1(3)/$22.50
Doc.No.: S0003-6951(05)08244-6
Published by: AIP, USA
DOCUMENT TYPE: Journal
TREATMENT CODE: Practical; Experimental
COUNTRY: United States
LANGUAGE: English
AN 2006:8690936 INSPEC
AB High-quality silicon nanowires (SiNWs) were synthesized via a thermal evaporation method without the use of catalysts. Scanning electron microscopy and transmission electron microscopy showed that SiNWs were long and straight crystalline silicon with an oxide sheath. Field effect transistors were fabricated to investigate the electrical

transport properties. Devices on as-grown material were p-channel with channel mobilities 1-10 cm2 V-1 s-1. Postgrowth vapor doping with bismuth converted these to n-channel behavior

L14 ANSWER 31 OF 36 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2003:7563352 INSPEC
DOCUMENT NUMBER: B2003-04-2560X-015
TITLE: Fabrication of single-electron tunneling transistors with an electrically formed Coulomb island in a silicon-on-insulator nanowire
AUTHOR: Dae Hwan Kim; Suk-Kang Sung; Kyung Rok Kim; Jong Duk Lee; Byung-Gook Park (Inter-Univ. Semicond. Res. Center, Seoul Nat. Univ., South Korea)
SOURCE: Journal of Vacuum Science & Technology B (Microelectronics and Nanometer Structures) (July 2002), vol.20, no.4, p. 1410-18, 18 refs.
CODEN: JVTBD9, ISSN: 0734-211X
SICI: 0734-211X(200207)20:4L.1410:FSET;1-H
Price: 0734-211X/2002/20(4)/1410(9)/$18.00
Doc.No.: S0734-211X(02)02904-9
Published by: AIP for American Vacuum Soc, USA
DOCUMENT TYPE: Journal
TREATMENT CODE: Practical; Experimental
COUNTRY: United States
LANGUAGE: English
AN 2003:7563352 INSPEC DN B2003-04-2560X-015
AB For the purpose of controllable characteristics, silicon single-electron tunneling transistors with an electrically formed Coulomb island are proposed and fabricated on the basis of the sidewall process technique. The fabricated devices are based on a silicon-on-insulator (SOI) metal-oxide-semiconductor (MOS) field effect transistor with the depletion gate. The key fabrication technique consists of two sidewall process techniques. One is the patterning of a uniform SOI nanowire, and the other is the formation of n-doped polysilicon sidewall depletion gates. While the width of a Coulomb island is determined by the width of a SOI nanowire, its length is defined by the separation between two sidewall depletion gates which are formed by a conventional lithographic process combined with the second sidewall process. These sidewall techniques combine the conventional lithography and process technology, and guarantee the compatibility with complementary MOS process technology. Moreover, critical dimension depends not on the lithographical limit but on the controllability of chemical vapor deposition and reactive-ion etching. Very uniform weakly p-doped SOI nanowire defined by the sidewall technique effectively suppresses unintentional tunnel junctions formed by the fluctuation of the geometry or dopant in SOI nanowire, and the Coulomb island size dependence of the device characteristics confirms the good controllability. A voltage gain larger than one and the controllability of Coulomb oscillation peak position are also successfully demonstrated, which are essential conditions for the integration of a single-electron tunneling transistor circuit. Further miniaturization and optimization of the proposed device will make room temperature designable single-electron tunneling transistors possible in the foreseeable future

L14 ANSWER 32 OF 36 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2003:7520987 INSPEC
DOCUMENT NUMBER: A2003-05-6855-061; B2003-03-0520F-011
TITLE: Epitaxial core-shell and core-multishell nanowire heterostructures
AUTHOR: Lauhon, L.J.; Gudiksen, M.S.; Wang, D.; Lieber, C.M. (Dept. of Chem. & Chem. Biol., Harvard Univ.,

Cambridge, MA, USA)
SOURCE: Nature (7 Nov. 2002), vol.420, no.6911, p. 57-61, 27 refs.
CODEN: NATUAS, ISSN: 0028-0836
SICI: 0028-0836(20021107)420:6911L.57:ECSC;1-U
Price: 0028-0836/02/$12.00+2.00
Published by: Nature Publishing Group, UK
DOCUMENT TYPE: Journal
TREATMENT CODE: Experimental
COUNTRY: United Kingdom
LANGUAGE: English
AN 2003:7520987 INSPEC DN A2003-05-6855-061; B2003-03-0520F-011
AB Semiconductor heterostructures with modulated composition and/or doping enable passivation of interfaces and the generation of devices with diverse functions. In this regard, the control of interfaces in nanoscale building blocks with high surface area will be increasingly important in the assembly of electronic and photonic devices. Core-shell heterostructures formed by the growth of crystalline overlayers on nanocrystals offer enhanced emission efficiency, important for various applications. Axial heterostructures have also been formed by a one-dimensional modulation of nanowire composition and doping. However, modulation of the radial composition and doping in nanowire structures has received much less attention than planar and nanocrystal systems. Here we synthesize silicon and germanium core-shell and multishell nanowire heterostructures using a chemical vapour deposition method applicable to a variety of nanoscale materials. Our investigations of the growth of boron-doped silicon shells on intrinsic silicon and silicon-silicon oxide core-shell nanowires indicate that homoepitaxy can be achieved at relatively low temperatures on clean silicon. We also demonstrate the possibility of heteroepitaxial growth of crystalline germanium-silicon and silicon-germanium core-shell structures, in which band-offsets drive hole injection into either germanium core or shell regions. Our synthesis of core-multi-shell structures, including a high-performance coaxially gated field-effect transistor, indicates the general potential of radial heterostructure growth for the development of nanowire -based devices

L14 ANSWER 33 OF 36 INSPEC (C) 2007 IET on STN
ACCESSION NUMBER: 2001:7119430 INSPEC
DOCUMENT NUMBER: A2002-02-8780B-037; B2002-01-7230J-051
TITLE: Nanowire nanosensors for highly sensitive and selective detection of biological and chemical species
AUTHOR: Yi Cui; Qingqiao Wei; Hongkun Park; Lieber, C.M. (Dept. of Chem. & Chem. Biol., Harvard Univ., Cambridge, MA, USA)
SOURCE: Science (17 Aug. 2001), vol.293, no.5533, p. 1289-92, 28 refs.
CODEN: SCIEAS, ISSN: 0036-8075
SICI: 0036-8075(20010817)293:5533L.1289:NNHS;1-L
Price: 0036-8075/01/$8.00
Published by: American Assoc. Adv. Sci, USA
DOCUMENT TYPE: Journal
TREATMENT CODE: Application; Experimental
COUNTRY: United States
LANGUAGE: English
AN 2001:7119430 INSPEC DN A2002-02-8780B-037; B2002-01-7230J-051
AB Boron-doped silicon nanowires (SiNWs) were used to create highly sensitive, real-time electrically based sensors for biological and chemical species. Amine- and oxide-functionalized SiNWs

exhibit pH-dependent conductance that was linear over a large dynamic range and could be understood in terms of the change in surface charge during protonation and deprotonation. Biotin-modified SiNWs were used to detect streptavidin down to at least a picomolar concentration range. In addition, antigen-functionalized SiNWs show reversible antibody binding and concentration-dependent detection in real time. Lastly, detection of the reversible binding of the metabolic indicator Ca2+ was demonstrated. The small size and capability of these semiconductor nanowires for sensitive, label-free, real-time detection of a wide range of chemical and biological species could be exploited in array-based screening and in vivo diagnostics

L14 ANSWER 34 OF 36 COMPENDEX COPYRIGHT 2007 EEI on STN
ACCESSION NUMBER: 2006(42):6643 COMPENDEX
TITLE: Simple and controlled single electron transistor based on doping modulation in silicon nanowires.
AUTHOR: Hofheinz, M. (DSM-DRFMC-SPSMS CEA-Grenoble, F-38054 Grenoble cedex, France); Jehl, X.; Sanquer, M.; Molas, G.; Vinet, M.; Deleonibus, S.
SOURCE: Applied Physics Letters v 89 n 14 2006.
SOURCE: Applied Physics Letters v 89 n 14 2006., arn: 143504 CODEN: APPLAB ISSN: 0003-6951
PUBLICATION YEAR: 2006
DOCUMENT TYPE: Journal
TREATMENT CODE: Theoretical; Experimental
LANGUAGE: English
AN 2006(42):6643 COMPENDEX
AB A simple and highly reproducible single electron transistor (SET) has been fabricated using gated silicon nanowires. The structure is a metal-oxide-semiconductor field-effect transistor made on silicon-on-insulator thin films. The channel of the transistor is the Coulomb island at low temperature. Two silicon nitride spacers deposited on each side of the gate create a modulation of doping along the nanowire that creates tunnel barriers. Such barriers are fixed and controlled, like in metallic SETs. The period of the Coulomb oscillations is set by the gate capacitance of the transistor and therefore controlled by lithography. The source and drain capacitances have also been characterized. This design could be used to build more complex SET devices. $CPY 2006 American Institute of Physics. 25 Refs.

L14 ANSWER 35 OF 36 COMPENDEX COPYRIGHT 2007 EEI on STN
ACCESSION NUMBER: 2005(46):12721 COMPENDEX
TITLE: Synthesis and postgrowth doping of silicon nanowires.
AUTHOR: Byon, K.; Tham, D.; Fischer, J.E.; Johnson, A.T.
SOURCE: Applied Physics Letters v 87 n 19 Nov 7 2005 2005.p 1-3
SOURCE: Applied Physics Letters v 87 n 19 Nov 7 2005 2005.p 1-3, arn: 193104 CODEN: APPLAB ISSN: 0003-6951
PUBLICATION YEAR: 2005
DOCUMENT TYPE: Journal
TREATMENT CODE: Theoretical; Experimental
LANGUAGE: English
AN 2005(46):12721 COMPENDEX
AB High-quality silicon nanowires (SiNWs) were synthesized via a thermal evaporation method without the use of catalysts. Scanning electron microscopy and transmission electron microscopy showed that SiNWs were long and straight crystalline silicon with an oxide sheath. Field effect transistors were

fabricated to investigate the electrical transport properties. Devices on as-grown material were p -channel with channel mobilities 1-10 cm2 V-1 s-1. Postgrowth vapor doping with bismuth converted these to n -channel behavior. $CPY 2005 American Institute of Physics. 19 Refs.

L14 ANSWER 36 OF 36 COMPENDEX COPYRIGHT 2007 EEI on STN
ACCESSION NUMBER: 2004(53):3751 COMPENDEX
TITLE: Synthesis and fabrication of high-performance n-type silicon nanowire transistors.
AUTHOR: Zheng, Gengfeng (Department of Chemistry Div. of Eng. and Applied Sciences Harvard University, Cambridge, MA 02138, United States); Lu, Wei; Jin, Song; Lieber, Charles M.
SOURCE: Advanced Materials v 16 n 21 Nov 4 2004 2004.p 1890-1893
SOURCE: Advanced Materials v 16 n 21 Nov 4 2004 2004.p 1890-1893
CODEN: ADVMEW ISSN: 0935-9648
PUBLICATION YEAR: 2004
DOCUMENT TYPE: Journal
TREATMENT CODE: Experimental
LANGUAGE: English
AN 2004(53):3751 COMPENDEX
AB The synthesis of single crystal n-type silicon nanowires (SINMs) with controlled phosphorus dopant concentration was discussed. The phosphorus-doped SiNWs were synthesized using silane in a gold nanocluster mediated by vapor-liquid-solid process. The effect of dopants in the electrical properties of these nanowires was investigated by changing the dopant concentration. The field effect transistors fabricated from these nanowires exhibit good device properties.(Edited abstract) 20 Refs.